Estimation of Low Energy Constants ERIC DEMARCO, Coastal Carolina University — We assess results from Heavy Quark Effective Theory using Bayesian Analysis to predict parameters. Bayesian analysis is especially effective because it incorporates prior information into models. Thus we seek posterior distributions that include our restrictions on the parameters. These parameters, called Low Energy Constants (LECs), occur in effective theories and can only be set by inference. We hypothesize that this analysis improves the estimates for LECs for D meson decay widths. These LECs appear not only in these expressions, but also in other calculations containing D mesons. This, along with the LECs' model-independence, means that our estimates can be used in all expressions involving D mesons. Therefore, the more accurately our analysis predicts the LECs, the more accurate the physical expressions containing these constants will become. We study increasingly complex effective theories by modeling with Markov Chains and the software BUGS (Bayesian inference Using Gibbs Sampling). Afterwards, we evaluate the rates of convergence of the various parameters by introducing slight modifications into the BUGS model. We report estimates for the most common LECs and analyze their reliability.

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